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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/662,704	09/15/2000	Shusuke Kaya	197261US2	1734

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EXAMINER

HARMON, CECIL B

ART UNIT PAPER NUMBER

2828

DATE MAILED: 01/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/662,704

Applicant(s)

KAYA ET AL.

Examiner

Cecil B. Harmon

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Semiconductor Device

DETAILED ACTION

Acknowledgement/Summary

1. The request for reconsideration dated 12 October 2001 has been entered on paper number 6, and considered, in the file wrapper and claims 1-17 are pending in application.
2. The reference Hashimoto et al. **[6067310]** was not correctly cited in the last Office action. The correct citation is shown on the attached PTO-892.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. **[60673104]** in view of Iwamoto et al. **[5744533]** Further in view of Howng **[4647895]**.
5. In regards to claim 1, Hashimoto et al teach in **Fig. 1**, a semiconductor **1** with multi-layer film **30** formed by laminating **col. 5, lines 10-17** the optical confinement layers **3 and 5** and active layers **Fig. 7, 4 and 5** so as to dispose each of the active layers **4 and 5** between the optical confinement layers **3 and 5**, such that one of the

opposite end **Fig. 7, 4f** perpendicular to the junction planes **Fig. 6, L1, L9** of the individual layers **Fig. 1,30** in the semiconductor multi-layer film **30** is coated with a low reflection film **20**; the other end is coated with a high reflection film **Fig. 1,100b**, where the low reflection film **20** contains a film which is composed of AL_2O_3 and has a resistivity of $10^{12} \Omega m$ or more.

6. Hashimoto et al. does not expressly teach that the AL_2O_3 composition has a resistivity of $10^{12} \Omega m$ or more. Iwamoto et al. **[5744533] col. 2, lines 15-29** teach of inorganic fillers such as silicon oxide and aluminum oxide (AL_2O_3) which have resistivities of 1×10^{21} and 1×10^{22} ohm-meter. Hashimoto et al. and Iwamoto et al. are analogous art because they are from similar problem solving area. At the time of the invention it would have been obvious to one of ordinary skill in the art to combine both reference, for doing so, would have provided enhanced thermo stability over the pure form of the conductive polymers. Therefore, combining both reference would have been obvious to obtain the invention as specified.

7. In regards to claim 2, Hashimoto et al. teach in **Fig. 1** that the low reflection film **20** is formed from a single layer **100f**.

8. In regards to claim 3, Hashimoto et al. teach in **Fig. 1**, that the low reflection film **20** is formed from a plurality of layers **30**.

10. In regards to claims 4 and 7, Hashimoto et al. teach in **Fig. 1** that the plurality **32** which has a refractive index higher than that of the AL_2O_3 see **col. 4, lines 19-33**.

9. In regards to claims 5 and 8, Hashimoto et al. teach in **Fig. 1**, that the film which has a refractive index higher than that of Al_2O_3 **col. 4, lines 19-33** is selected from the group consisting of α (amorphous) -Si and SiN. **See col. 3 and 4, lines 49-67 and lines 1-2.**

10. In regards to claims 9 Hashimoto et al. teach in **Fig. 1**, a semiconductor **1** with multilayer film **30** formed by laminating **col. 5, lines 10-17** the optical confinement layers **3 and 5** and active layers **Fig. 7, 4 and 5** so as to dispose each of the active layers **4 and 5** between the optical confinement layers **3 and 5**, such that one of the opposite end **Fig. 7, 4f** perpendicular to the junction planes **Fig. 6, L1, L9** of the individual layers **Fig. 1, 30** in the semiconductor multi-layer film **30** is coated with a low reflection film **20**; the other end is coated with a high reflection film **Fig. 1, 100b**, where the low reflection film **20** contains a film composed of Al_2O_3 stoichiometric ratio composition.

11. Hashimoto et al. **[60673104]** does not expressly teach Al_2O_3 stoichiometric ratio composition. Howng **[4647895]** **col. 2, lines 13-22** teach that the resistivity varies on a logarithmic basis relative to changes in temperature depending on the stoichiometric ratio of the elements in the composition. Hashimoto et al. and Howng are analogous art because they are from similar problem solving area. At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine both references in

order to reduce the cost of the sensor and to enhance the sensitivity, medium temperature range and electrical resistive ceramic sensor. Therefore, combining both reference would have been obvious to obtain the specified invention.

12. In regards to claim 10 Hashimoto et al. teach in **Fig. 1** that the low reflection film **20** is formed from a single layer **100f**.

15. In regards to claim 11, Hashimoto et al. teach in **Fig. 1**, that the low reflection film **20** is formed from a plurality of layers **30**.

13. In regards to claims 12 and 15, Hashimoto et al. teach in **Fig. 1** that the plurality of layers **30** which are composed of Al_2O_3 **col. 4, lines 19-33** and a film containing Si **32** which has a refractive index higher than that of the Al_2O_3 **see col. 4, lines 19-33**.

14. In regards to claims 13 and 16, Hashimoto et al. teach in **Fig. 1**, that the film which has a refractive index higher than that of Al_2O_3 **col. 4, lines 19-33** is selected from the

group consisting of α (amorphous) -Si and SiN. **See Figure 1, col. 3 and 4 lines 49-67 and lines 1-2**

15. In regards to claim 17, Hashimoto et al. disclose that the Al_2O_3 film **col. 4, lines 19-33** is deposited by an electron cyclotron resonance plasma sputtering process, electron beam evaporation process, or an electron beam sputtering process **see col. 8, lines 20-23**.

16. In regards to claim 6, Hashimoto et al. does not expressly teach that the high reflection film which contains a film comprising at least Al_2O_3 having resistivity of $1 \times$

10**12 ohm-meter or more. Iwamoto et al. **[5744533]** col. 2, lines 15-29 teach of inorganic fillers such as silicon oxide and aluminum oxide (Al_2O_3) which have resistivities of 1×10^{21} and 1×10^{22} ohm-meter. Hashimoto et al. and Iwamoto et al. are analogous art because they are from similar problem solving area. At the time of the invention it would have been obvious to one of ordinary skill in the art to combine both reference, for doing so, would have provided enhanced thermo stability over the pure form of the conductive polymers. Therefore, combining both reference would have been obvious to obtain the invention as specified.

17. In regards to claim 14, Hashimoto et al. disclose that reflection film **20** contains a film composed of Al_2O_3 stoichiometric ratio composition.

18. Hashimoto et al. **[60673104]** does not expressly teach Al_2O_3 stoichiometric ratio composition. Howng **[4647895]** col. 2, lines 13-22 teach that the resistivity varies on a logarithmic basis relative to changes in temperature depending on the stoichiometric ratio of the elements in the composition. Hashimoto et al. and Howng are analogous art because they are from similar problem solving area. At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine both references in

order to reduce the cost of the sensor and to enhance the sensitivity, medium temperature range and electrical resistive ceramic sensor. Therefore, combining both reference would have been obvious to obtain the specified invention.

Response to Argument


19. The request for reconsideration dated 12 October 2001 has been entered on paper number 6, and considered, but does not overcome the rejection because the prior art, Hashimoto et al., as outlined in this action, clearly delineates the cited elements/limitations, in claims 1-17, as a prima-facie case of obviousness as set forth under statutory guide lines 35 USC 103.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cecil B. Harmon whose telephone number is 703-306-0247. The examiner can normally be reached on 8am-4pm.

21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Dzierzynski can be reached on 703-308-4822. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-0956 for After Final communications.

22. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956


Paul Ip
Primary Examiner